Signature Assignment

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PsyD726: Quantitative Research Methods I

Signature Assignment

Abstract

In this paper, I used descriptive statistical methods to examine demographic, behavioral, and psychosocial variables in an archived dataset. In this paper, I analyzed education level, life mastery, smoking behavior, perceived stress, and life satisfaction to better understand participant characteristics and data distribution patterns. In this paper, histograms and numerical summaries were used to describe each variable, including measures of central tendency and variability such as the mean, median, and standard deviation. In this paper, I focus on examining variables, including education level, life mastery, stress, and life satisfaction, using histogram and summary statistics to report central tendency and variability. This paper sues summary statistics and histograms to examine the distributions and variability of variables, while considering the overall data quality and sampling characteristics. Overall, this paper shows how using descriptive statistics provides an understanding of data structure to support accurate interpretation.

Descriptive Analysis of Behavioral and Psychosocial Variables: Insights from Archived Data

Overview and Purpose

Descriptive statistics are an important part of psychological and social science research because they summarize data by showing averages, how much scores vary, and how values are spread across a dataset (Field, 2018). For example, reporting the average stress score in a sample, along with how much individual stress scores differ form the average, which helps researchers understand what is typical versus unusual in the data (Field, 2018). Understanding patterns in a population helps researchers identify trends, outliers, and possible biases that could influence how results are interpreted (Pallant, 2020). For example, if a small number of participants report high stress levels, outliers can shift the overall results and lead researchers to draw inaccurate conclusions if they are not examined carefully (Pallant, 2020).

This paper examines five variables from an archived dataset, education level, T-master for life score, smoke number, TP stress, and life satisfaction to understand patterns in individuals' behavior and well being (Pallant, 2020). For example, analyzing education level alongside TP stress can help researchers show whether individuals with higher education report lower stress levels, while examining smoke numbers can show smoking

behavior relates to overall life satisfaction (Pallant, 2020). These variables were selected because they help explain participants' thinking patterns, behaviors, and psychosocial functioning. For example, education level and T-master for life scores show cognitive and self-management skills, while TP stress and life satisfaction show emotional and psychosocial well-being, which shows a more complete picture of participants' experiences (Pallant, 2020).

Table 1

Results

Descriptives

Descriptives

	educ	tmast	smokenum	tpstress	tlifesat
N	439	436	360	433	436
Missing	0	3	79	6	3
Mean	4.09	21.8	16.6	26.7	22.4
Median	4	22.0	0.00	26.0	23.0
Standard deviation	1.23	3.97	44.9	5.85	6.77
Minimum	1	8.00	0.00	12.0	5.00
Maximum	6	28.0	280	46.0	35.0

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[1] The jamovi project (2025). *jamovi*. (Version 2.7) [Computer Software]. Retrieved from https://www.jamovi.org.

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Context and Ratioanale for Variables

A person's education level is often linked to their health habits, ways of thinking, and life outcomes (Ross & Mirowsky, 2019). For example, individuals with higher education might exercise regularly, make healthier food choices, make plan long-term career goals, which shows how education shapes life and decisions (Ross & Mirowsky, 2019). Looking at education levels helps researchers understand how schooling might relate to other factors, like stress or overall happiness. For example, people with more years of education might report lower stress. At work and higher satisfaction with life, showing how education can influence mental and emotional well-being. The T-master for life score shows how much control and confidence people feel they have over their own lives and challenges. For example, someone with high T-master score might feel confident managing their career, finances, and personal relationships, while someone with a lower score might feel overwhelmed or unsure in these areas (Bandura, 1997). Stress affects the body and the mind, which influences health, behavior and emotional well-being. For example, high stress might result in headaches, anxiety, or impulsive decisions, while moderate stress can motivate meeting deadlines or problem solving (Cohen et al, 2016). Life satisfaction measure a person's overall sense of well-being, including emotional feelings and cognitive judgments about life (Diener et al, 2018). For example, someone might feel happy with relationships and career success, which can

increase overall life satisfaction. The smoke number represents a behavioral variable relevant to public health, which shows how frequently participants engage in health-risk behavior (CDC, 2021). For example, higher smoke numbers might show regular cigarette use, which can be linked to stress levels or lifestyle choices.

The paper focuses on providing a detailed descriptive analysis of these variables using numerical summaries and graphical representations such as histograms. For example, histograms can show the distribution of TP stress scores across participants, which can help identify patterns and extreme values (Gravetter & Wallnau, 2020). Combining numerical summaries and graphical analyses allows for the evaluation of central tendencies, variability, and distributional characteristics of each variable, while identifying potential outliers (Field, 2018). For example, the mean and histogram of smoke number can show that a few extreme smokers influence the average, which shows the need for careful interpretation. The analysis shows methods for interpreting skewed data, managing missing values, and addressing extreme observations, all of which are important fro producing reliable findings (Gravetter & Wallnau, 2020).

Methods

The data for this analysis were sourced from the archived dataset *ArchivedData.sav*, which includes demographic, behavioral, and psychosocial variables (Pallant, 2020). For this study, five variables were selected: education level, T-master for life score, smoke number, TP stress, and life satisfaction. These variables show they capture behavioral, cognitive, and psychosocial aspects of functioning, providing a clear view of participants' experiences. Education level and T-master for life scores show cognitive abilities and self-management skills, while TP stress and life satisfaction provide show emotional and psychosocial well-being. Smoke number offers a behavioral perspective which is focused on public health outcomes (Diener et al, 2018). Education level is measured on an ordinal scale from 1 to 6, with higher numbers showing higher formal education. For example, participants with higher education scores demonstrate better health literacy, enhanced coping strategies, and structured decision-making (Ross & Mirowsky, 2019). The T-master for life score assesses perceived life mastery and self-efficacy as a continuous variable. For example, individuals with high scores might feel confident managing their career, finances, and personal relationships, while participants with lower scores might experience challenges (Bandura, 1997). Smoke number show the number of cigarettes smoked per day and serves as a behavioral indicator of engagement in health-risk behaviors. For example, participants reporting higher smoke numbers might be at

increased risk for negative health outcomes, while non-smokers show minimal behavioral risk (CDC, 2021). TP stress is a continuous measure of perceived stress levels. For example, high stress scores might show difficulties in emotional regulation, while moderate scores can show typical stress responses that motivate goal-directed behavior (Cohen et al, 2016). Life satisfaction shows well-being, including cognitive evaluations and emotional feelings about life. For example, participants with higher life satisfaction scores might report contentment with relationships, career, and personal growth, while lower scores might show dissatisfaction or unmet goals (Diener et al, 2018).

Data Cleaning and Preparation

The dataset was opened using Jamovi, a free statistical software that works with SPSS .sav files (The Jamovi Project, 2023). Before analyzing the data, missing values were checked to ensure accuracy (Field, 2018). Missing values were identified for several variables: smoke number (n=79), T-master for life score (n=6), and life satisfaction (n=3). For example, if a participant did not answer about how many cigarettes they smoke per day, their smoke number value would be missing, which could affect the calculation of the average smoke number. Overall, any participants who didn't answer a question for a variable were left out of the calculations for that variable, a method called listwise deletion (Field, 2018). For example, if someone didn't report their T-master fro life score, their response wouldn't be included when calculating the average T-master score, but their answers, like education or stress can still be used.

Statistical Analysis

Descriptive statistics were calculated for each variable, including the mean, median, mode, standard deviation, minimum, and maximum values, to summarize central tendency, variability, and the range of observed scores (Field, 2018). For example, the mean shows the average score, while the median provides the middle value, which can help to understand responses even when outliers exist. Histograms were created for each variable to visually examine the distribution of scores (Gravetter & Wallnau, 2020). For example, a histogram of smoke number can show that most participants report zero cigarettes, but a few extreme values stretch the distribution to the right. Distribution shapes were evaluated as normal, skewed, or bimodal, and extreme outliers were identified. For example, a bimodal distribution in life satisfaction may show two distinct subgroups of participants with different experiences (Diener et al., 2018).

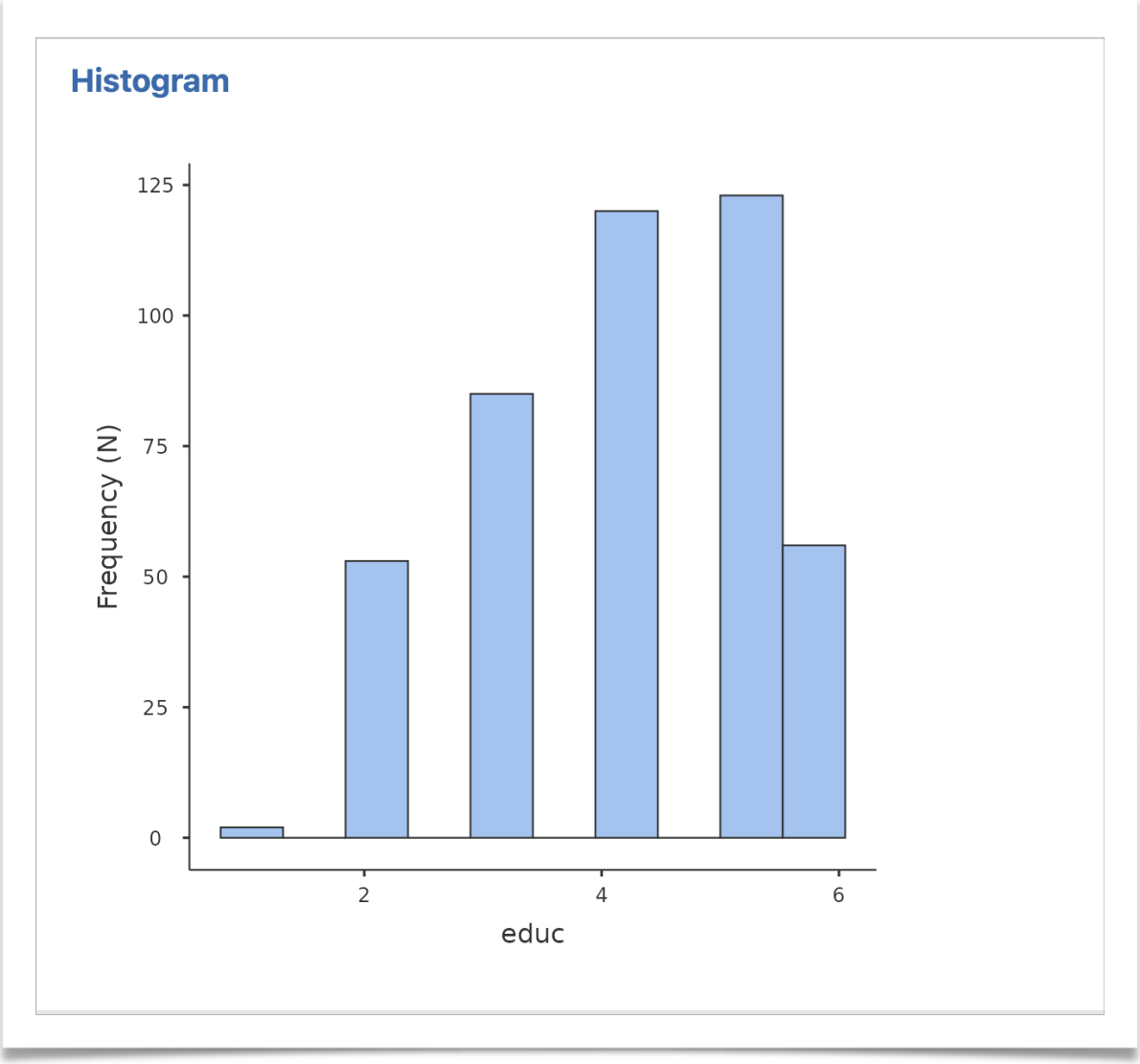
Additionally, histograms were populated to visually examine the distributional shape of each variable, which were classified as normal, skewed, or bimodal, and extreme outliers were identified. These steps allowed researchers to assess patterns in the data, identify potential outliers, and understand the nature of the variables, which is critical for interpreting results accurately (Gravetter & Wallnau, 2020).

Results

The descriptive statistics for education level show a mean 4.09, a median of 4, and a standard deviation of 1.23, a minimum of 6, with no missing data. For example, most participants reported moderate education levels around the median value (Ross & Mirowsky, 2019). The histogram for education level shows a roughly normal distribution with a slight right skew. For example, while most participants cluster in the middle of the eduction levels, a few have the highest education scores, slightly stretching the tail of distribution (Ross & Mirowsky, 2019). Most participants reported moderate education levels, while fewer reached highest levels of education. For example, a small number of participants had completed graduate degrees, which shows that very few in the sample attained the highest formal education (Ross & Mirowsky, 2019).

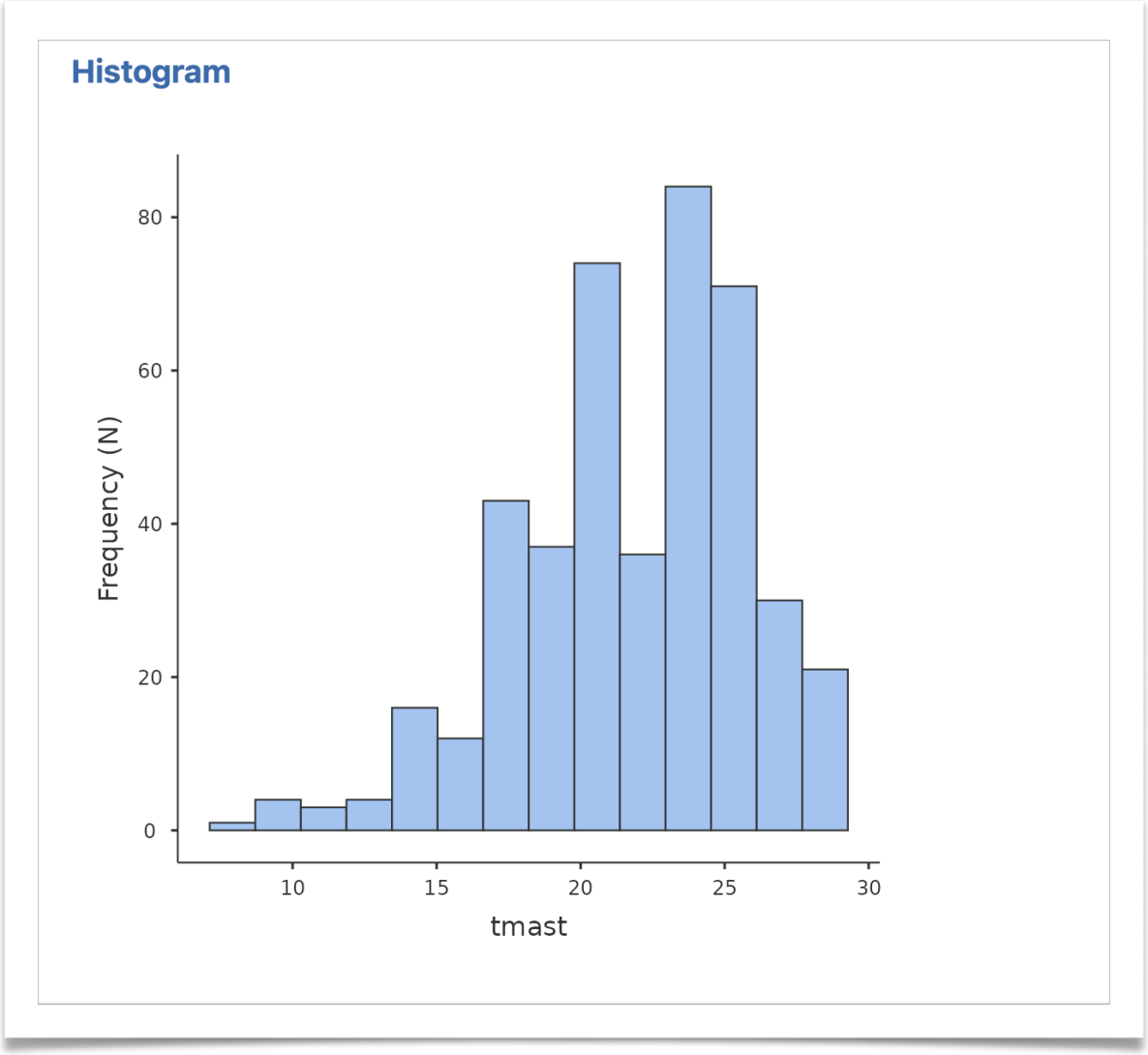
Signature Assignment

Figure 1



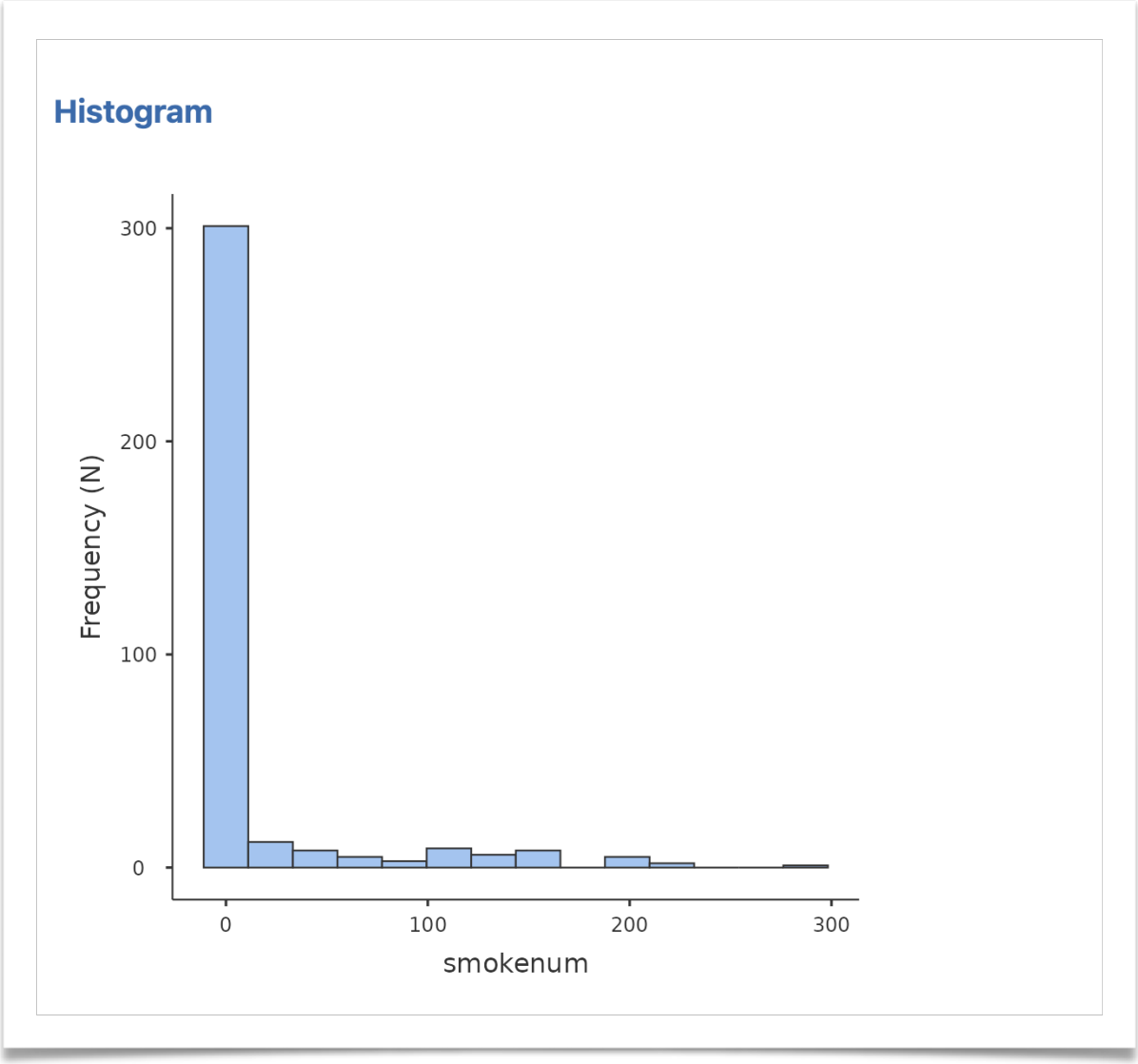
The T-master for life scores had a mean of 21.8, a median of 22, and a standard deviation of 3.97, with values ranging from 8 to 28 and three missing scores. For example, a participant might feel confident managing challenges like work responsibilities of personal relationships (Bandura, 1997). The distribution of T-master for life is slightly positively skewed, which shows taht most participants reported higher life mastery. For example, many participants show they feel confident handling daily challenges, a few with lower scores might struggle with task like managing work or personal responsibilities (Bandura, 1997).

Figure 2



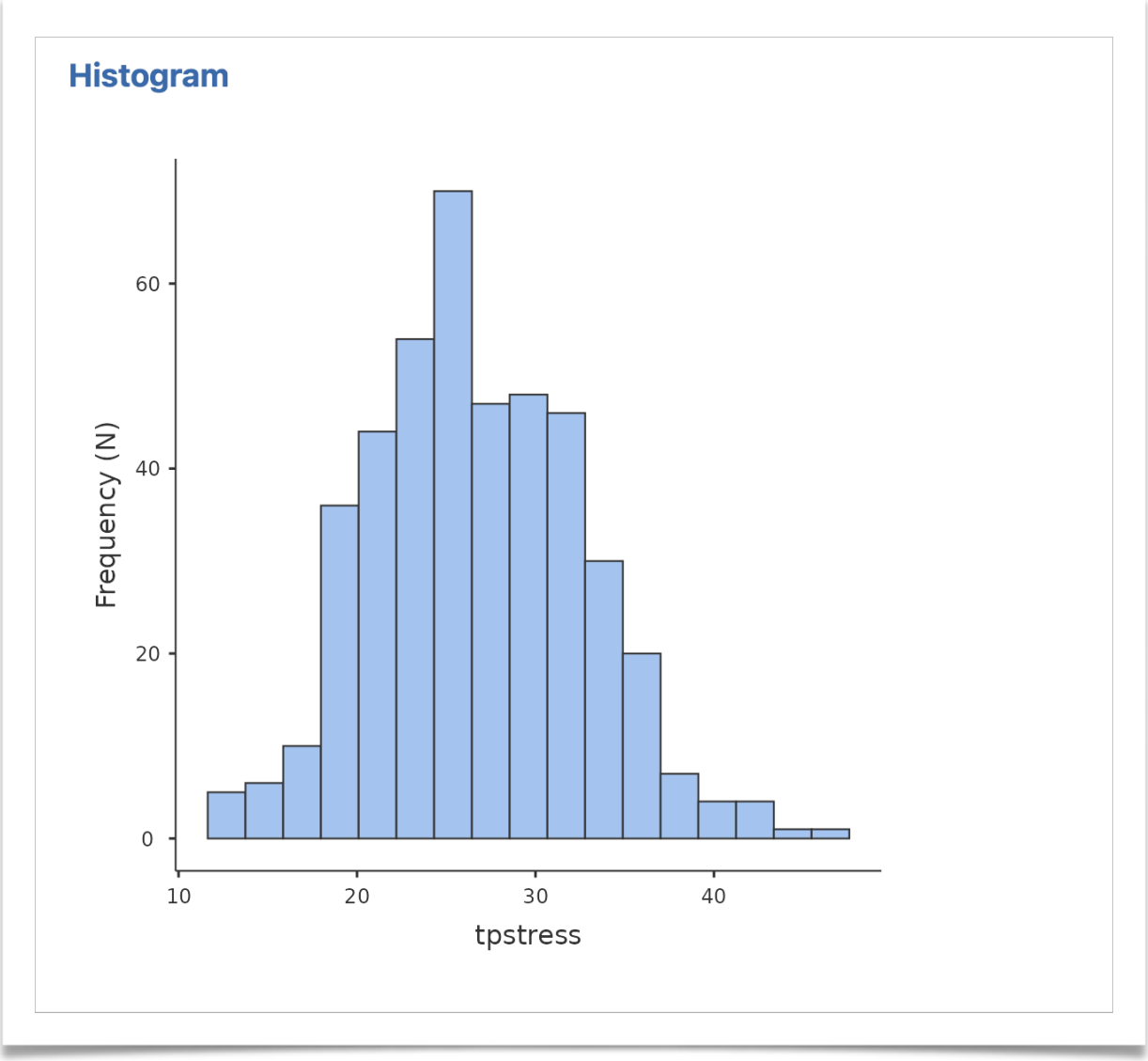
The smoke number variable had a mean of 16.6, a median of 0, and a standard deviation of 44.9, with observed values that range from 0 to 280 and 79 missing data points. For example, most participants smoked heavily, which can show varying health behaviors and risk levels (CDC, 2021). The histogram for smoke numbers is highly positively skewed, which shows that most participants reported zero cigarettes, while a few had very high smoking values. For example, this skew suggests that interventions might need to focus differently on non-smokers versus heavy smokers (CDC, 2021).

Figure 3



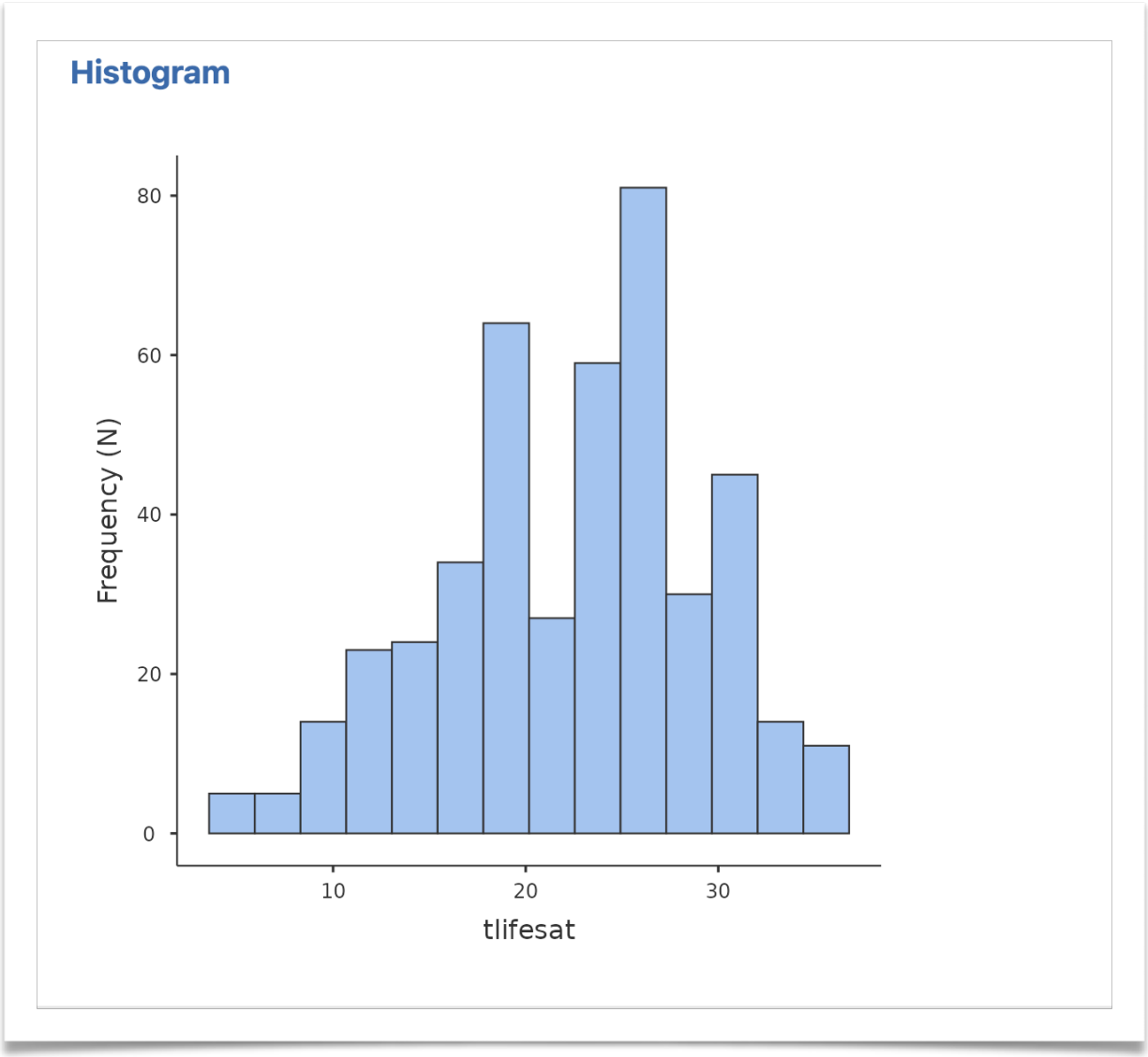
TP stress scores had a mean of 26.7, a median of 26, and a standard deviation of 5.85, ranging from 12 to 46 and six missing values. For example, most participants experienced moderate stress, while a few reported very low or very high stress, which might show who can benefit from targeted stress management strategies (Cohen et al., 2016). The histogram shows that TP stress scores are roughly normally distributed. For example, most participants reported moderate stress, while a few had very high or very low stress, which shows that the group's stress experiences are similar and might indicate direct comparisons in analyses (Cohen et al, 2016).

Figure 4



Life satisfaction scores had a mean of 22.4, a median of 23, and a standard deviation of 6.77, ranging from 5 to 35 and three missing values. For example, some participants show high satisfaction with their relationships, career, and personal growth, while others show lower satisfaction, which reflects a variation in coping strategies, life circumstances, or personality traits (Diener et al, 2018). Overall, the descriptive statistics and distributions show that participants varied in education, life mastery, smoking behavior, stress, and life satisfaction. For example, while most participants reported moderate education and life mastery, non-smoking behavior, and moderate stress, there were subgroups with high smoking levels or lower satisfaction that might benefit from targeted interventions (Diener et al, 2018).

Figure 5



Discussion

The descriptive analyses shows how the shape of the variable's distribution affects interpretation. For example, understanding whether a variable is normally distributed or skewed can guide researchers in choosing appropriate measures of central tendency and variability (Field, 2018). Normal distributions, such as observed for education and TP stress, which help the mean to accurately show the central tendency. For example, the average TP stress score reliably shows most participants' stress levels in the sample (Field, 2018). Highly skewed variables, such as smoke number, highlight the usefulness of median and interquartile range to show typical behavior. For example, even though a few participants smoked heavily, the median shows that most participants did not smoke at all, which provides a clear picture of the sample (CDC, 2021). Bimodal distributions, like the one observed in life satisfaction, shows a distinct view of subgroups. For example, some participants reported high satisfaction with relationships and careers, while others reported lower satisfaction, which could justify separate analyses or qualitative exploration to understand differences (Diener et al, 2018).

Practical Implications

Education level and life mastery scores provide insight into participants' self-efficacy and readiness for behavioral interventions. For example, individuals with higher education and stronger life mastery show better health literacy and more effective coping strategies when managing stress or health-related decisions (Ross & Mirowsky, 2019). Smoking behavior also has important practical results, as the highly skewed distribution shows that most participants are not engaged in risky health behaviors. For example, while the majority reported no cigarette use, a small group of heavy smokers can benefit from targeted public health education or cessation support (CDC, 2021). Stress and life satisfaction findings can help guide counseling, coaching, or mental health interventions. For example, participants reporting higher stress or lower life satisfaction can benefit from targeted support focused on stress management, emotional regulation, or improving overall well being (Cohen et al, 2016).

Limitations

Missing data, especially for the smoke number, could have influenced the results. For example, participants who did not report smoking behavior could differ consistently from those who did, which can affect how accurately smoking patterns are presented in the sample (Field, 2018). Because the data were self-reported, responses might be influenced by social desirability or recall bias. For example, participants might

underreport smoking levels to present as more beneficial (Pallant, 2020). Skewed distributions shows that caution is needed when interpreting mean values across the sample. For example, in the case of smoking behavior, the mean might overestimate typical use because a small number of heavy smokers can inflate the average (Field, 2018). Future research could use correlation analyses to examine relationships between education, stress, smoking, life satisfaction, and T-master scores. For example, researchers could explore whether higher education or greater life mastery is linked with lower stress or higher life satisfaction (Field, 2018). Overall, future studies can use regression or structural equation modeling to predict life satisfaction from behavioral and psychosocial factors. For example, smoking behavior, stress levels, and life mastery can be examined together to better understand which variables strongly influence well-being (Field, 2018).

In conclusion, this analysis examined demographic, behavioral, and psychosocial variables to better understand patterns in the sample by using descriptive statistical methods. While evaluating education level, life mastery, smoking behavior, perceived stress, and life satisfaction, the results showed how central tendency, variability, and distributional shape contribute to significant interpretation of data. The findings show the importance of selecting appropriate statistical measures when distributions are skewed or bimodal and emphasize the value of combining numerical summaries with graphical representations. Together, the results show a clear overview of participant functioning and reinforce the role of descriptive statistics in identifying trends, variability, and potential areas for further investigation. Overall, this analysis highlights the foundational role of descriptive methods in psychological research and usefulness in guiding interpretation, intervention planning, and future analytical methods.

References

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Signature Assignment

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